

#### JS006298019B1

# (12) United States Patent

Watanabe et al.

## (10) Patent No.:

US 6,298,019 B1

(45) Date of Patent:

Oct. 2, 2001

## (54) OPTICAL DISK APPARATUS

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(\*) Notice: Subject to any disclaimer, the term of this

patent is extended or adjusted under 35

U.S.C. 154(b) by 0 days.

(21) Appl. No.: 09/430,040

T-1 27 1000

(22) Filed: Oct. 29, 1999

## Related U.S. Application Data

(62) Division of application No. 08/688,294, filed on Jul. 29, 1996, now Pat. No. 6,011,762.

(30) Foreign Application Priority Data	(30)	Foreign	Application	<b>Priority</b>	Data
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(JP) 8-08124		
G11B 7/00	Int. Cl. <sup>7</sup>	(51)
	U.S. Cl.	(52)
369/47 27- 369/47 55- 369/53 20		

(56) References Cited

#### U.S. PATENT DOCUMENTS

5,671,203 9/1997 Ra.

5,684,773		11/1997	Hayashi .	
5,710,749		1/1998	Tsukai et al	
5,724,325		3/1998	Jeong .	
5,751,675	*	5/1998	Tsutsui et al 369/44.34	į
5,754,507		5/1998	Nishikata .	
5,757,743		5/1998	Decusatis et al	

#### FOREIGN PATENT DOCUMENTS

7-129968 5/1995 (JP).

\* cited by examiner

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### (57) ABSTRACT

An optical disk apparatus comprises a focusing means for focusing a light beam on a recording medium having first and second information faces; means for moving a focal point of the light beam in a direction substantially perpendicular to the information faces of the recording medium; means for detecting a reflected light from the recording medium; means for detecting a focus condition of the light beam on the basis of an output signal from the reflected light detecting means; a focus control means for driving the focal point moving means on the basis of an output signal from the focus condition detecting means, and controlling the light beam so that the focus condition of the light beam becomes a prescribed focus condition; and a focus jumping means for moving the focal point of the light beam from the first information face to the second information face by driving the focal point moving means.

## 15 Claims, 28 Drawing Sheets

